

Plenary Address

The Challenge of Making the Transition from Individual to Ecological Intelligence in an Era of Global Warming

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The problem today is that most of us have been educated in western style educational institutions and thus have been socialized to think and communicate in the metaphorical language framed by analogs settled upon by earlier western thinkers who were unaware of environmental limits. The combination of hubris and a deeply held prejudice toward indigenous cultures, which had already developed ecological intelligence that enabled many of them to live within the limits and possibilities of their bioregion, led western thinkers to take a different path into the future. As we can now recognize, this path has led to environmentally destructive technologies and the hyper-consumer dependent lifestyle now being globalized. Whether we have the time to develop a life-sustaining ecological intelligence will depend upon the length of time we have before the rate and scale of environmental changes embroil civil societies in wars of survival. It will also depend upon whether public school teachers and university professors have the will to recognize how the past continues the linguistic colonization of the present. Unfortunately, even if our educational institutions are able to socialize the next generations in how to exercise ecological intelligence in their daily lives, political power will remain in the hands of the older generation that still takes for granted the deep cultural assumptions that underlie the capitalist/industrial mode of consciousness. If we are to take Albert Einstein's warning seriously, namely that we cannot rely upon the same mindset that created the problem to fix it, we need to begin thinking of how to exercise ecological intelligence and thus to move to a post-industrial form of consciousness. This will be an especially difficult challenge for educational reformers as most classroom teachers and university professors have been socialized to think in the metaphorical language that earlier thinkers succeeded in establishing as the basis of modern thought.

Before discussing some of the characteristics of ecological intelligence that will represent a special challenge, it is necessary to identify the scale and scope of the ecological crises—especially since our technologies and economic systems are able to maintain the illusion for many people that this is still an era of plenitude and that, if there is a problem, it is that they do not have enough money to consume as much as can be produced by the industrial system. There are many dimensions of the ecological crises that are beginning to impact directly the lives of the middle class in many countries, and are already threatening the lives of several billions of people who are struggling to meet the basic necessities of life. These include the melting of glaciers that are the source of potable water, the spread of droughts, the changes in the chemistry of the world's oceans and the collapse of major fisheries, the disappearance of over thirty percent of the world's topsoil, the loss of forests that serve as carbon sinks, and the extinction of species. Other losses that usually do not make this kind of list include the loss of the linguistic diversity and intergenerational knowledge that sustain the diversity of the world's cultural commons. The latter two losses are especially important as they are sources of knowledge and skills that have en-

abled different cultures to live with a smaller carbon and toxic footprint. Today, these losses force more people to be dependent upon consumerism at a time when automation, outsourcing, and downsizing by corporations in search of greater profits make it increasingly difficult to earn the money necessary for meeting basic needs.

The three interconnected areas we need to rethink if educational reforms are to contribute to making the transition to an ecological form of intelligence include the following. First, we need to learn to make the transition from thinking of intelligence as an attribute of the autonomous individual to understanding the characteristics of ecological intelligence, as well as how to reinforce them as part of the student's taken-for-granted pattern of thinking. Second, there needs to be wider understanding on the part of professors and classroom teachers of how language carries forward the misconceptions and values of earlier thinkers who were unaware of environmental limits. Third, how to revitalize the cultural commons, as well as understanding how they are being undermined (enclosed), need to become part of the curricula of public schools and universities. At the university level, the focus needs to be on the various cultural forces that are transforming what remains of the world's diversity of cultural commons into new markets. These forces include the destructive influence of western philosophers and social theorists who ignored environmental limits, denigrated other cultural ways of knowing, and ignored the ecological importance of the cultural commons.

Often overlooked is how educational reformers reproduce the same misconceptions and silences found in the university's academic disciplines. The idea that intelligence is an attribute of a potentially autonomous individual, that language is a conduit in a sender/receiver process of communication (a myth essential to representing data and information as objective and rationality as free of cultural influences), and that critical thinking always leads to progress, are misconceptions that have been recycled from generation to generation of professors across the disciplines. This recursive process, in turn, is carried on in classrooms around the world. The silences perpetuated in academic disciplines include ignoring that most words are metaphors that carry forward the misconceptions of earlier thinkers, and ignoring that the local cultural commons existing in every community represent alternatives to the consumer-dependent lifestyle and the toxic footprint we are now recognizing as having immediate and long-term catastrophic consequences for all forms of life. These silences also include ignoring the various forms of ecological intelligence developed by indigenous cultures. While their mythopoetic narratives differ widely, none of them relied upon the Cartesian epistemology that made irrelevant the need to give close attention to the natural cycles occurring in local ecosystems and to learn the intergenerational knowledge and skills that enabled them to live within the limits and possibilities of the local environments.

There is also a problem with the legacy of how universities organize and pass on the knowledge within the different disciplines. Separating knowledge into categories such as history, political science, philosophy, science, and so forth, creates a problem that is now being recognized by national organizations, such as the American Association for Sustainability in Higher Education and the British Higher Education Academy, which are now promoting sustainable educational reforms across the disciplines. The major drawback they are attempting to rectify is the failure of faculty to adopt interdisciplinary approaches to addressing ecologically problematic cultural issues and practices. This remains an unaddressed challenge facing most advocates of ecologically sustainable educational reforms. Educators in various subject areas need to learn, for example, why the science teacher as well as the teachers in the social sciences and in English need to collaborate if students are to understand different aspects of the cultural commons, and

how they have become enclosed—and the resulting environmental impacts. To cite a second example, few classroom science teachers understand the deep cultural assumptions they share with the market liberals, or how many of the technologies based on their research have contributed to the loss of intergenerational knowledge that has a smaller ecological footprint. As the metaphors framed by the analogs chosen by earlier thinkers are relied upon in every area of the curriculum, no one professor or classroom teacher can provide students with an understanding of how so many aspects of culture carry forward the ecologically destructive misconceptions, prejudices, and silences taken for granted in the past.

The following summary of three specific educational reforms that need to be addressed if fostering ecological intelligence is to become a goal of education is intended to highlight the need to become aware of what Gregory Bateson refers to as an ecologically destructive cultural epistemology. As it has dominated the thinking across the disciplines as well as teacher education, many of the core assumptions underlying this cultural epistemology are likely to be taken for granted, and thus will be difficult to recognize as problematic—which brings us back to Einstein’s warning about continuing to rely upon the same mindset to fix the problems it created. The following summary is also intended to provide an overview of the cultural, linguistic, historical, and philosophical areas of study that need to be examined in terms of how they have been complicit in the formation of the cultural roots of the ecological crisis. The summary represents only a starting point. The real work still lies ahead, and it can only contribute to an ecologically sustainable future if there is a willingness to put aside the formulaic progressive thinking that has led to overshooting environmental limits and to colonizing other cultures.

In the interest of brevity, I will summarize key ideas in three areas that must be addressed in thinking about educational reforms that foster ecological intelligence. My focus will be on the ecologically problematic cultural assumptions and linguistic patterns that are taken-for-granted by most professors and classroom teachers, and not on the daunting challenge of how to get them to rethink the assumptions their academic careers are based upon.

Fostering Ecological Intelligence

The ancient Greek word *oikos* referred to a wide range of cultural practices in the household and community. It was only later that Ernst Haeckel (1834-1919) transformed it into the neologism “oecologie” that eventually became “ecology”—that is, the study of natural systems. We need to recover the ancient Greek understanding of learning the cultural patterns of moral reciprocity essential to community—while also retaining the more contemporary understanding of the behavior of natural systems as ecologies. Both cultural and natural ecologies involve interdependent systems, where no organism or action exists on its own. Gregory Bateson (1972) refers to the changes circulating within different ecosystems, and within and between cultural and natural systems, as the “difference which makes a difference” (p. 315). These differences, or actions upon an action, can also be understood as the patterns that connect, which in turn lead to changes in other participants in the cultural and natural ecology. In short, ecological intelligence takes account of relationships, contexts as well as the impacts of ideas and behaviors on other members in the cultural and natural systems. Rachel Carson’s recognition of the connections between the use of DDT and the decline in the local population of birds is an example of recognizing the patterns that connect. Many of her critics took for granted that, like other scientific discoveries, DDT was yet another expression of progress—which led them to ignore the impact on natural systems. The myth of progress, especially scientific-based progress, reinforced

the taken-for-granted pattern of thinking that, in turn, led to ignoring the difference (introduction of a toxic pesticide) that makes a difference (the dying off of birds).

Ecological intelligence is what many indigenous cultures rely upon in order to adapt their cultural practices to the cycles of renewal in their bioregions. For example, the Quechua of the Peruvian Andes express ecological intelligence in their ability to observe what the changes in their environment are communicating about when and where they should plant their fields. Their ceremonies both re-enact the patterns of human/nature interdependence as well as give thanks for how nature nurtures them. Many scientists are now exercising a limited form of ecological intelligence as they study the energy flows and cycles of renewal. Social scientists also rely upon a limited form of ecological intelligence when they study the patterns that connect, such as how the patterns of discrimination and class differences impact the lives of people.

Ecological intelligence takes into account the interacting patterns, ranging from how behaviors ripple through the field of social relationships in ways that introduce changes that are ignored by non-ecological thinking, to how an individual's actions introduce changes in the energy flows and alter the patterns of interdependence within natural systems. When we pay attention to contexts, interactions, and the consequences that follow from these actions, we are also exercising ecological intelligence. Ecological intelligence is not something we have to create anew, as it goes back to the form of intelligence exercised in hunter-gatherer cultures. They had their mythopoetic narratives, but their survival depended upon careful observation of the cycles and patterns in the environment—as well as the intergenerational knowledge they continually tested and refined.

Unfortunately, western philosophers from Plato to the present have largely denigrated this form of intelligence by representing rational, abstract, and thus decontextualized thinking as having higher status (Bowers, 2007b). Over the centuries, ecological intelligence has been further undermined as the idea of the autonomous individual became accepted as the basis of the political and social justice systems in the west—and now as the source of ideas and values. The introduction of perspective by artists in the early 15th century helped to strengthen the cultural myth that privileged the individual as a separate onlooker on an external world, just as René Descartes further strengthened the myth of intelligence as separate from the cultural and natural ecologies that individuals interact with in ways that are too often ignored. Today, the myth of the autonomous individual is being reinforced by educators who urge students to construct their own ideas, and who promote computer-mediated learning on the grounds that it enables students to decide what they want to learn and value (Bowers, 2007a). Cellphones as well as many other cultural forces further undermine awareness of contexts, relationships, interdependencies, and the consequences of human behaviors that ripple through both cultural and environmental ecologies. Such taken-for-granted linguistic conventions as using the phrases “I think,” “I want,” and “what do you think?” continually reinforce the myth of not being part of the interdependent cultural and natural ecosystems, but rather being a separate observer, thinker, and actor.

What are the implications for educational reformers? The first would be to become more aware of how the taken-for-granted cultural assumptions reinforce the idea that intelligence is an attribute of an autonomous individual. Special attention needs to be given to how the student may represent her/himself as being an autonomous observer and source of originality and intentionality. As noted above, this assumption as well as many of today's other taken-for-granted cultural assumptions gave conceptual direction and moral legitimacy to the industrial/consumer culture that is now entering its digital phase of globalization. Other assumptions include the idea that change is an inherently progressive force, that this is a human-centered universe, that

mechanism provides the best explanatory framework for understanding organic processes, that language is a conduit in a sender/receiver process of communication, that traditions limit the individual's freedom and self-discovery, that (still for some) patriarchy was part of the original creative process, and that free markets have the same standing as the law of gravity.

A second suggestion would be for participants in a learning situation to reinforce each other in giving closer attention to the cultural and environmental patterns that connect, to the consequences that follow from different behaviors, and whether these consequences have an empowering or detrimental effect on others—in both the cultural and natural systems. The subjectively centered self is such a prominent tradition in mainstream western culture, even among artists and people searching for a deeper sense of meaning and purpose, that it needs to be discussed and, if possible, reframed in ways that take account of how an action affects the actions of others, including the natural systems, in ways that influence their development. A key to making the transition to ecological intelligence is recognizing that there are no isolated events, facts, actions—everything, as Bateson points out, is part of a larger system of information exchanges. One of the more difficult sources of resistance to obtaining this awareness is the way in which print, both in books and in computer-mediated communication and thinking, marginalizes the importance of contexts, tacit understandings, and awareness of the history of the larger network of relationships. Even when what is represented by the printed word is situated in terms of its history, the history is also an abstract construction that is unable to accurately represent the culturally mediated, embodied experiences of participating in the cultural and natural ecology of an earlier time.

How Language Thinks Us as We Think Within the Possibilities Made Available by the Language

Just as the cultural assumptions have led to thinking that individuals are basically autonomous beings (or have the potential to become autonomous), we also have a tradition of thinking of the other participants in these complex cultural and natural ecologies as being self-contained entities, such as a weed, a crime, a behavior, a value, an idea, and even the printed word. The spoken word, on the other hand, makes it easier to recognize the different dimensions of the cultural ecology in which it occurs. Context, memory, reciprocal actions, tacit understandings, and immediate consequences are accessed through all the senses, and affect understandings and actions. Given the privileged status that the printed word has in public schools and universities, it is necessary to emphasize the importance of helping students to recognize that words are not autonomous entities into which teachers/professors, authors, and computer software writers put their meanings and then convey them to others.

Our educational institutions leave most graduates with the idea that language is a neutral conduit that enables ideas, objective data, and information to be passed to others. That is, most students graduate without understanding that most words are metaphors that carry forward the meanings framed by an earlier choice of analogs. Many of these analogs were chosen by *men* who were unaware of environmental limits, and who took for granted many of the cultural assumptions of their era. Recognizing that words have a history has important implications that are seldom considered. That is, they are part of a complex linguistic ecology that can be traced back to earlier narratives and evocative experiences. Thus, the use of such words and phrases as *tradition*, *technology*, *property*, *data*, *intelligence*, *progress*, *critical thinking*, and so forth, carry forward the way of thinking of earlier times—as well as the silences and prejudices that were taken for granted.

Overcoming this general lack of historical perspective suggests one of the ways educators can foster ecological intelligence. Students need to be encouraged to examine the history of key words in the modern vocabulary that are contributing to undermining the intergenerational knowledge of the community, to the colonization of other cultures, and that lead to behaviors that further degrade the environment. For example, they need to consider the cultural context that influenced John Locke's analogies for understanding the right of individuals to own property, the early cultural basis for thinking of technology as a neutral tool, as well as the basis for thinking of traditions as obstructing progress and rational thought.

Ecological intelligence involves escaping from the linguistic colonization of the present by the past. To reiterate a key point: words have a history, and the word *conservative*, when used as a category of political theory in the west, can be traced back to Edmund Burke, who warned about the danger of basing changes on abstract (and supposedly universal) ideas, to Michael Oakeshott, who explained how the rationalization of the workplace deskills the worker, to the authors of *The Federalist Papers*, who justified the separation of powers in our system of government, to contemporary environmental thinkers such as Aldo Leopold, Val Plumwood, Wendell Berry, and Vandana Shiva.

The word *conservative* carries forward many problematic interpretations of what should be conserved, such as free market systems and prejudicial traditions. The important point, however, is that the genealogy of political metaphors such as conservatism, liberalism, libertarianism, socialism, Marxism, as well as the root metaphors that frame their respective agendas and silences, need to be examined in terms of their hidden forms of colonization. Given the global threat of corporate capitalism, which increasingly relies upon surveillance technologies and subverts democratic decision making, it is important to think ecologically about how to rectify the use of our political vocabulary that may otherwise lead people to equate the political slippery slope leading to the further enclosure of the diversity of the world's cultural commons with modern progress and development. What Naomi Klein (2007) documents in her recent book, *The Shock Doctrine: The Rise of Disaster Capitalism*, is a powerful example of how modern political metaphors hide the process of economic and cultural colonization. Ecological intelligence avoids accepting the authority of abstract words and theories by focusing on how the consequences of policies affect the prospects of the other participants in the larger cultural ecology—as well as the fate of the natural systems.

How Fostering Ecological Intelligence Leads to Revitalizing the Local Cultural Commons

To reiterate, the way most educators accept basing relationships and values on the meaning of words that were framed by analogs selected hundreds of years ago becomes especially critical to whether we move to a post-industrial form of consciousness and community. Substituting the phrase “cultural and environmental commons” for what most people associate with the word *community* will help in making this transition. Even in its most positive use, the word *community* is too limited to convey the complexity of the cultural and natural ecologies that we depend upon. Stripped down to the simplest explanation, the cultural commons represents the intergenerational knowledge, skills, and mentoring relationships that enable members to be more self-reliant in the areas of food, healing, creative arts, craft skills, narratives, ceremonies, civil liberties, and other aspects of daily life that are less dependent upon consumerism and participation in a money economy. Basically, it encompasses what is shared in common, which may also include traditions of exploitation and prejudice.

The word *commons* is now being used to refer to the cyber-commons, and its history in understanding the environment as a commons can be traced back to Roman law. The intergenerational knowledge and skills now being widely shared—ranging from how to grow, prepare, and share a meal, how to discover talents and skills in a wide range of the arts, to the local efforts to make political decisions that protect the local cultural and environmental commons from being integrated into the supposedly free-market economy—have profoundly different consequences than what is experienced in a consumer-dependent lifestyle. Curriculum reforms that contribute to revitalizing the cultural commons enable people to be less dependent upon a money economy that too often exploits both the most vulnerable people as well as the environment that future generations will depend upon. The intergenerational knowledge and skills that represent alternatives to the industrial mode of production and consumption also have a smaller carbon and toxic ecological footprint. Furthermore, strengthening the local cultural commons leads to developing the skills and relationships that are the basis of mutual support. In short, these life-sustaining forms of ecological intelligence will vary from culture to culture and from bioregion to bioregion. And like all empowering and skill-sharing traditions, such as the slow food movement, that are carried forward by mentors, the cultural and environmental commons will continue to exist along with a more selective dependence upon modern technologies. The challenge for educational reformers, which is being made more daunting by the ideology that justifies greater reliance upon computer-mediated learning, is to help students become aware of the forms of knowledge that take account of the limits and possibilities of the local bioregion, as well as patterns of mutual support that are essential to moving into the post-industrial era that we must enter if we are to avoid total ecological collapse.

The revitalization of local cultural commons occurring in different regions of the world, and known in Great Britain as the transition communities (Hopkins, 2008), involve mutually supportive intergenerationally connected relationships. These relationships, if examined in terms of specific activities and skill development, are not framed in terms of fostering more “individual self-direction,” “independence,” “emancipation,” and “decolonization and reinhabitation.” These words and phrases are based on the same deep cultural assumptions that lead to the kind of individualism required by the industrial/consumer-oriented culture. As these words and phrases have a special standing in the thinking of both market and social justice liberals, it is important to clarify how metaphors that are often associated with progress in achieving fuller individual lives may actually support the forces that lead to a consumer-dependent lifestyle. In *Rebels Against the Future*, Kirkpatrick Sale (1995) notes that “it was the task of industrial society to destroy all...that ‘community’ implies—self-sufficiency, mutual aid, morality in the market place, stubborn tradition, regulation by custom, organic knowledge instead of mechanistic science.” He goes on to identify the connection often overlooked by educational reformers, who emphasize the importance of individual emancipation: namely, that all the local cultural commons (largely non-monetized traditions) “that kept the individual from being a consumer had to be done away with so that the cogs and wheels of an unfettered machine called ‘the economy’ could operate without interference” (p. 38). In short, the industrial/consumer-oriented culture requires the further enclosure of the cultural commons and an educational system that hides the dynamics of how language, in carrying forward the analogs settled upon by earlier culturally specific thinkers, is part of this colonizing process.

The linguistic tradition of reproducing the conceptual errors of the past (in this case, the analogs settled upon by Enlightenment thinkers) can still be seen in how much of our thinking represents “traditions” as obstacles to progress and individual self-discovery. However, when we

consider the traditions of organic gardening, of craft skills and knowledge, of the creative arts, of local decision-making about how to protect civil liberties and the viability of the environmental commons, we find the traditions we re-enact and modify in daily life are not impediments to progress. The exercise of ecological intelligence does not require thinking of progress as in opposition to traditions. Nor is the student's discovery of interests and development of talents undermined by the forms of intergenerational knowledge and skills that are the community-basis of mutual support.

If we consider most learning relationships, without succumbing to the meaning of words dictated by the ideology of various expressions of liberal/progressive thinking that have given us a mixed legacy of social justice achievements and the industrial/consumer-dependent culture, we will find that traditions, intergenerational knowledge and skills, awareness of relationships and patterns of mutual support, the use of language that takes account of context and tacit understandings, and moments of dialogue, are integral to the students' pursuit of interests, questions, and desire to achieve at a deeper level of accomplishment. We need to continually think against the grain of today's formulaic thinking by keeping in mind that the western theorists who identified the analogs that now frame the meaning of such words as progress, individualism, freedom, emancipation, and so forth, were not aware of ecological limits. Their analogs reflected the advanced thinking of their era. Like the Roman god Janus, their vocabulary enabled us to make important gains in the area of correcting social injustices and in establishing a framework for civil liberties. Now educational reformers need to revise this vocabulary in ways that are culturally and ecologically informed. Words can then take on the meanings that reinforce the exercise of ecological intelligence, which requires becoming more ethnographically informed about the differences between the cultural patterns that strengthen traditions of community mutual support and those that adversely impact the viability of natural systems.

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